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STUDENT REPORT

EJECTION SITUATIONS IN THE U-2/TR-1:
AN ANALYSIS OF EMOTIONS AND EVENTS

MAJOR DAVID J. BONSI

88-0330

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<p>Although the Air Force continually attempts to make the flying profession a safer business, its primary focus has been the "why"--the reason for the mishap, be it mechanical failure, weather, pilot error, etc. In contrast, this study focuses on what the crewmember sees and feels. The author analyzes nine U-2/TR-1 potential or actual ejection situations. The analysis includes discussion of the ejection decision process, emotional reactions, and subsequent chain of events initiated by these situations. The findings conclude that pilots who have ejected have significantly different perceptions of events and emotional reactions from their potential-ejection counterparts.</p>					
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PREFACE

Mystery novelist Robert Ludlum has used as a preface an "Epilogue as a Prologue," the purpose being to emphasize *the end* instead of the story. Similarly, that is my intent here. The reader should not focus on a specific event but gain from the compilation of experiences. This preface will initially describe the study's intended use and introduce the subjects covered by chapter. Yet more importantly, I must also acknowledge the assistance and insights of others that led me through this analysis.

First, what is this study's purpose or intended use? Primarily, this paper will relate some common experiences and feelings which occurred as a direct result of potential and actual ejections from the U-2/TR-1. The analysis of these situations may aid others faced with similar situations. For that reason, the focus and primary audience of the study is the U-2/TR-1 pilot.

The focus then led to the structuring of chapters. In an attempt to give the reader some background in this subject area, the first chapter, "22 May 1984," is a detailed description of the events and emotions I experienced the day of my ejection.

"Issues" covers several problem areas noted in the cases studied. The final chapter, "Lessons," consolidates what a crewmember may anticipate and learn from these type incidents. By design, the *issues* and *lessons* are intended to vaguely parallel an aircraft mishap report's *findings* and *recommendations*. Therefore, several subjects are discussed in both chapters. Still, I could not have found any issues or lesson without a great deal of assistance.

My request for associated information from Air Force agencies met with mixed results. Mr. Rudy Delgado, Egress System Safety Manager, AF Inspection and Safety Center (AFISC), provided his study on "The Timely Escape Decision." In addition, Major Jim Nicol, also of the AFISC, went to extra lengths so that I could review the official AFISC narrative of my ejection in 1984. However, my other requests for information from AFIT, the AF Human Resources Laboratory, and other offices in AFISC met with apathy or a simple lack of documentation for the information requested. *Finally and most importantly*, I want to emphasize the inputs of other U-2/TR-1 pilots.

CONTINUED

When I started this project, I sent personal letters to eight current or former U-2/TR-1 pilots who had experienced what I considered either potential ejection situations or those that had used "the nylon letdown." Acknowledging the potential ejection situations studied are not all inclusive of even recent U-2/TR-1 incidents, they are representative and include a majority of such situations. Each pilot responded frankly and purposely to my questions. I blended these written inputs with previous discussions I've had with these individuals. Most readers will find, and some may be critical of, the emotional tendency of the paper. Yet while writing, I actually found relaying the events much easier than conveying the emotions my friends related to me. If anything, this writing is deficient in expressing the true emotion levels encountered. These pilots gave forthright and intense responses to my questions which gave this study substance. The "emotional strain" is a reflection of those responses.

By request, several pilot's did not wish to be "glorified" in this report. Therefore, no specific attribution to any of these individuals is presented in the study even though I am much indebted to each of them for their help. The reader should understand that this project is a compilation of our experiences and emotions so that others who may fall victim to similar circumstances can learn from them.

ABOUT THE AUTHOR

Major David J. Bonsi graduated from the United States Air Force Academy in 1974 with a Bachelor of Science degree in International Affairs. In September of that year, Major Bonsi entered Undergraduate Pilot Training (UPT) at Vance AFB, OK, which was followed by assignment to Minot AFB, ND, as a KC-135 co-pilot. In 1978, he was selected to be an instructor at the Officer Training School, Lackland AFB, TX. Following the stay in Texas, he moved to Beale AFB, CA, in October 1980. There he performed duties as a KC-135 Aircraft Commander; Command Post Controller/Emergency Actions Officer; and U-2/TR-1 pilot, instructor, and evaluator. In May 1984, Major Bonsi ejected from a crippled U-2 shortly after takeoff. He has logged more than 2500 flying hours in the KC-135, T-38, CT-39, and U-2/TR-1. Before his assignment to the ACSC Class of 1988, Major Bonsi received his Master of Science degree in Systems Management from the University of Southern California.

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EXECUTIVE SUMMARY

Part of our College mission is distribution of the students' problem solving products to DoD sponsors and other interested agencies to enhance insight into contemporary, defense related issues. While the College has accepted this product as meeting academic requirements for graduation, the views and opinions expressed or implied are solely those of the author and should not be construed as carrying official sanction.

"insights into tomorrow"

REPORT NUMBER 88-0330

AUTHOR(S) MAJOR DAVID J. BONSI, USAF

TITLE EJECTION SITUATIONS IN THE U-2/TR-1: AN ANALYSIS OF EMOTIONS AND EVENTS

I. Purpose: To provide background on actual and potential U-2/TR-1 ejection experiences, discuss several problem areas which the pilots noted during their experiences, and consolidate the lessons derived from those experiences.

II. Problem: Although the Air Force Inspection and Safety Center (along with other AF agencies) devotes much time and effort in making the flying profession a safer business, most of their studies focus on the reason for the mishap--mechanical failure, improper maintenance, pilot error, etc. However, the author believes too little attention has been directed at *what the crewmember sees and feels*. What does a pilot experience in a possible or actual ejection situation? What are the events that follow? What are the emotions that run through the course of events before, during, and after the ejection? Can other crewmembers be better prepared for these events?

III. Discussion of Analysis: The primary basis of the analysis

CONTINUED

is the exploration of five emergency situations and four ejections from the U-2/TR-1. The issues the author examines are the decision to eject, the publicity surrounding the studied incidents, the impact on the pilots and their families, and the influence these experiences could have on future ejection decisions. In addition, the discussion includes analysis of the pilots' reaction to mishap investigation boards and their feelings on returning to flying.

The study found that while the decision to eject has many variables, the overriding determinator to the pilot is the question of aircraft controllability. Having to recover a crippled aircraft or deciding to eject from that aircraft have differing impacts from the publicity generated from those events. Those who recovered their aircraft received justifiable acclaim while "the ejectors" felt the stigma of "not being able to produce the miracle." The families also felt the brunt of the emotions generated by "Daddy's ejection." Yet, even considering these negative aspects, all the pilots questioned emphasized a future decision to eject would be based on that situation and not previous experiences.

Lastly, the pilots who ejected were highly critical of how the accident investigation was handled. The pervading feeling of accusation instead of investigation was always present. Then when cleared to return to flight duty, most pilots have a very strong apprehension about trusting a machine that already came very close to killing them.

IV. Findings: (1) Crewmembers cannot automatically assume that mishap board members are open-minded or empathetic for the trauma associated with an ejection experience. (2) Although medical personnel attempt to speed a pilot's physical recovery following an ejection, they are often "cool" in their approach and sometimes unresponsive to the patient's needs. (3) Following an ejection, the family will have a continuing fear that "next time he might not come home." (4) The return to the cockpit will normally be a very frightening event. If facilities and aircraft permit, a pilot who has ejected should be required to fly with an instructor before returning to solo flight. (5) Even having enjoyed a thorough training program, a pilot must be ready for those "unexpected events." (6) Several important factors involved in the ejection decision are command influence, temporal distortion, and "knowing I can do nothing else."

Chapter 1

22 MAY 1984

0430 came early as it normally does at that time of the morning. I reluctantly climbed out of bed with a mild headache of unknown origin. So I downed a couple aspirin, washed up, shaved, and headed for breakfast. Following the rather unspectacular meal, my mobil (backup pilot) and I checked the weather and had a final review of the mission. Little did I know what lay ahead.

About 0615, I checked in with our detachment's physiological support division (PSD). They are the people entrusted with maintaining our pressure suits so vitally necessary for high altitude flight and who are responsible for "the suit-up" and strapping us into the airplane. Before climbing into the pressure suit for the planned 9+ hour mission, the PSD technician administered the normal, minor physical to include a check of blood pressure, heart rate, and body temperature. As usual, my blood pressure was slightly elevated. I always get a bit excited before flying an operational reconnaissance sortie.

After the suit up, I proceeded to the aircraft for strap-in and final systems checks. As a "well-seasoned veteran" of a previous operational deployment to this area, the checks and procedures went smoothly and quickly. In a short time, I was ready to go.

Starting the engine was my first opportunity to release a little of the adrenaline I always seem to have before an "ops sortie." Feeling the airplane come to life and respond to my commands made me feel secure that this was just another mission. When it was over, I'd be with the guys in the club for Happy Hour.

Taxiing to the runway was slow as it always is in a fully loaded U-2, also known as the "Dragon Lady." Although she's normally a good handling machine in the air, the U-2 is anything but a congenial lady on the ground. As I nursed us toward the runway, I noted that my lap belt was not as tight as I normally liked. The slow taxi speed gave me the chance to cinch it down a bit.

As I approached the end of the runway, I requested and received takeoff clearance from the tower. My mobil made a final

runway sweep ahead of me and checked my aircraft configuration. He gave me a thumbs up and I nodded my head in reply--I was clear to go.

I held the brakes and advanced the throttle to 80% RPM. Exhaust gas temperature (EGT), oil temperature and oil pressure were all good. I released brakes and advanced the throttle to the wall.

As the aircraft gradually accelerated, I focused my attention down the runway to maintain directional control and keep the wings level. I broke ground and momentarily held the "Lady's" nose low to start the acceleration to climb airspeed, then brought the nose up to a very respectable climb angle for a fully loaded, non-afterburner aircraft. It was landing gear up, and let's go see what the "bad guys" are up to today. Passing 1400ft, I notified radar departure control that I was airborne and climbing on course. Shortly thereafter, another normal "day at the office" became very abnormal.

In the climbout around 2500ft, I felt a severe jolt behind me. The aircraft shook violently as warning lights illuminated and the associated warning horn blared in my ear. At the same time, I felt what I thought was a very noticeable decrease in thrust. The engine overheat light came on and the EGT indicator spun crazily. I throttled back, lowered the nose to establish a glide, and initiated a 180 degree turn back toward the runway. I hoped to get the plane safely back on the ground.

I had obtained about 10 degrees of left bank in my climb out of the traffic pattern before the onset of my problem, so I merely tried to steepen the bank angle to return to the airfield. Quickly, I noticed my bank inputs through the controls were not having the desired effect. In fact, I was now rolling through wings level and starting into a right bank as I held the controls to the left. Additionally, I had noticed that the nose of the aircraft was falling lower than what I wanted for my glide. As I brought the control column back in an attempt to raise the nose, I noticed items not tied down in the cockpit were now floating around me--"I'm not flying; I'm falling!"

The roll to the right accelerated and the pitch angle was about 30 degrees nose down. My thoughts raced. "My God, what am I doing here? What did I do wrong? Things like this don't happen in the U-2." The bank angle was now passing through 60 degrees. "I don't know why this is happening but I have to 'get out.' This thing is rolling inverted and diving toward the ground. If it goes upside down before I 'punch,' this ejection seat is going to try to bury me in the mud. Go for the [ejection] ring, NOW." As my right hand grasped the ring, my mobil radioed, "BAILOUT!" I was happy to hear someone else

agreed with that choice. As I pulled the ring with all my strength, I hoped it wasn't too late.

The very rapid sequence of events now became slow motion. I felt the "pop" as I pulled the ejection ring that set off the first in the series of explosive initiators. I told myself, "Keep alert if you can. This is going to be some kind of experience." Out of the corner of my eye, I noticed the canopy lift off the rails as the seat started its upward motion on a small ballistic charge. The main ejection rocket then fired as something violently smashed me in the face knocking me further back in the seat. I didn't see what it was but later found out it was the partially separated canopy.

For all that had happened until this point, I honestly wasn't really scared. Although I knew I was in a very difficult situation, proper training had kept me relatively calm. But no one had ever said anything about getting hit in the face while ejecting. Now I was scared!!

I suppose it was a reflex reaction that held my eyes closed at this point. As I cleared the aircraft I felt the impact of the airstream, and I momentarily rejoiced in the quiet as I left the scream of impending disaster behind. "Calm down. Think. What was the training?" I forced my eyes open again just as the ejection rocket finished its burn. The seat and I were flying nearly parallel to the ground as the man-seat separator forcefully threw me away from the ejection seat. It was now up to me and the parachute. As the separator gave me a half tumble forward the chute started its bloom. I swung below what felt like a safe canopy and knew it was again time to re-evaluate where I was and what was to immediately follow.

I looked up through the broken plexi-glass faceplate and its bent locking bar. "Oh well, nothing ever goes exactly right. I feel good now, and that full chute sure is beautiful!" Later, I thought of how I would have probably died had the helmet been similarly damaged in a high altitude ejection. Fortunately, it was not a real problem here. I estimated my altitude at about 1500ft based on previous parachuting experience. "Where will I land? What is the wind direction and how strong? I sure don't want to land in those irrigated rice fields if I don't have to. That ornery 'Lady' didn't kill me yet; I'd hate to drown in that foul smelling water and fertilizer!" Then I saw a dry field. The wind helped as I turned the chute and stabilized the descent. Touchdown--"The Eagle has landed!"

The light winds made my parachute landing fall (PLF) relatively easy in the soft, dry field I managed to hit. Being so proud of this one small target conquest, I jumped up only to realize I had failed to deploy the 40+ lbs survival kit that was

still strapped to my backside. I chuckled, "You dumb ****!"

As I unhooked my non-essential gear and parachute, a score of local nationals rushed to my aid. I was almost euphoric to be relatively unhurt and standing among friendlies. Then I saw the burning wreckage of my aircraft 180 yards away. The locals must have seen the instant hurt on my face. Even though there was a significant language barrier, I knew they were asking if there was another crewman onboard. "No, it was just me and the Lady."

"Maintain control." I was on the ground and safe no more than a mile and a half from the end of the runway. My adrenaline was flowing! "Walk back to the base and ask where the hell they've been! No, stay put. Even as a Boy Scout you learned that the shock of an accident will tend to make people do silly things. There are plenty of locals around now and nobody can miss the burning remains of the plane nearby."

The first American to arrive was one of our U-2 crew chiefs. He obviously witnessed the takeoff and departure, and reacted when things didn't go as planned. He and other maintenance personnel drove a truck as far as they could within the base perimeter fence and found a hole which he crawled through. He then ran the mile and a half over fairly rugged terrain to get to me. "Yeah, I'm OK. Thanks," I answered as he arrived. Thanks was all I could say, but I saw the genuine concern not only in my own crewchief, but also in the anxious faces of what we'd call "primitive" rurals in a foreign land. That honest concern for me will not be forgotten.

Somewhat shaken but a bit more in control now, I sat on top of my survival kit among a growing crowd of "fans" to await the "cavalry." I heard the steady beat of a helicopter in the distance and assumed the "official" help was on the way. The chopper settled close by and the medic insisted I recline on their stretcher for my ride back to the airfield and the hospital. I complied.

As the paramedics loaded me aboard I felt my first apprehension of flying. I had just experienced a failure of an air machine that quite possibly could have killed me, and now I was being loaded on another aircraft that didn't even have wings. If given the choice at that moment, I would have walked to the hospital.

My anxiety faded as the helicopter settled on the airfield parking ramp and a group of our detachment's personnel closed around me to check on my condition. I assured them I was fine, just shaken up a little. None-the-less, the Ops Officer insisted on escorting me to the hospital in the ambulance.

The scene at the hospital was almost as frightening as watching my aircraft burn. Doctors, nurses and technicians scurried about in varying degrees of panic. Order and discipline seemed non-existent. At one point, an argument even erupted between the doctors as to who was in charge--the emergency room doctor or the flight surgeon? I was not swamped with a wave of confidence. Then this medical crowd calmed as they came upon their first real problem.

The body they wanted to examine (me) was still encased in one of America's finest made pressure suits, the likes of which most of them had never seen before. Most of the brainstormed solutions involved cutting through the suit's three layers of nylon, rubber, and assorted materials, which would not have been an easy task. However, the real heart of the problem was the heavy metal ring around my neck which joined the helmet to the suit. I realized this would have been a serious dilemma had I been unconscious or seriously injured, but I was almost unscathed. As they were about to take a knife to this suit, costing the government over a hundred thousand dollars, I suggested I could undress from the suit as I normally did. After several puzzled looks circled the room, the team decided this would be the easiest solution.

Having witnessed me climb out of the pressure suit, which requires a few contortionist moves, most of the doctors knew I wasn't really hurt. But the flood of examinations, x-rays, and tests continued. I knew they were doing this for my welfare, but the many trips from office to lab and lab to doctor coupled with the exams at each stop were nearly as physically abusing as the ejection. The only interruption that came was a call from the Vice Wing Commander at home. (The Wing Commander was off station at the time).

The Vice Commander's questions centered on my condition and what had happened. "Yes, sir. I'm fine." Beyond my condition I didn't feel comfortable discussing specifics on that unsecure phone line. Yet, his questions probed and I probably said more than I should have under the circumstances. As he concluded he asked if I had been able to talk with my wife. "No, sir. I don't know if she's heard about things yet."

I always knew SAC had relatively good communications assets, and within an hour I was in contact with my wife. Thousands of miles away, the squadron had located two other spouses who were close friends with my wife, and they told her what had happened before I phoned. It seems that this day had not been very bright for either her or the kids even before she received the news. After we talked, I still sensed in her voice a strong fear, yet a great relief that I was OK.

Later that day, the doctors permitted me visitation rights, and many friends and co-workers came to wish me well. They all heralded my choice for making the right decision at the right time. I received flowers, cookies, smuggled-in beer, get well cards, and lots of warm feelings. But on the night of May 22, 1984, sleep did not come easy.

Chapter 2

ISSUES

Since I became familiar with the U-2/TR-1 program in 1981, three pilots besides myself have ejected from these aircraft, and several others have faced serious emergencies which could have easily turned into ejection situations. My intent is to review the four incidents that resulted in ejections and another five potential ejection situations. I will focus primarily on each pilot's decision to eject or stay with the aircraft, the notoriety each received because of the incident, the impact the incident had on the pilots' families, and the influence such an experience might have on a future ejection decision. In addition, I will explore the pilots' reactions to the mishap investigations conducted after each of the ejections and the pilots' feelings of returning to the cockpit when cleared.

Deciding to Eject

First and perhaps most importantly, what are the elements involved in an ejection decision? Since the first ejection from an F-86 in 1949 through 4,930 other such incidents by the end of 1985 (excluding combat ejections), only 82% were successful in saving the life of the crewmember. (8:2) Of the 889 crewmembers who did not survive, 61% died because they ejected outside the capabilities of the ejection system, most often caused by a delayed decision. (8:19) Another 116 died just between 1981 and 1985 not even attempting to eject. (8:25) "Mishap analysis has revealed that the majority of ejection fatalities were not due to mechanical malfunctions, but were the direct results of *delayed ejection attempts!*" (2:22) Then there must be some reason why some crewmembers would stay with a "sick" airplane while others felt the egress system was the best way out.

The reasoning of the five U-2/TR-1 pilots who didn't eject varied on why they decided to stay with the aircraft. The approach appeared to be situational, yet the overall emphasis was "do I have control?" (9:--) Along those lines, three of the five admitted to seriously contemplating ejection while the other two never considered themselves in grave danger. (9:--)

The elements of each case were described differently but

consistently. Those who had not seriously thought of leaving the aircraft felt they never got into a position from which they could not recover even though they were radioed to eject if necessary. (9:--) The others felt they might possibly lose control and have to eject. (9:--) In one instance this concern stemmed from physical fatigue in trying to control the aircraft while receiving little assistance from supervisory people on the ground. (9:--) In contrast, one pilot contemplating a possibility of ejection remembered, "I did this [eject] once and don't want to do it again." (9:--) He had to "leave" a crippled A-7 a few years before. Those who actually decided to eject experienced other feelings.

The key elements in deciding when to eject are, "Can I still fly this airplane, and when is the last instant I can safely eject?" In a serious emergency, "the adrenaline is pumping." (9:--) As I described my mishap in the preceding chapter, I continually questioned if I had done something wrong to cause this out-of-control situation until I realized there was nothing else I could do. Another crash victim recalled the self-questioning, "Am I in a stall?" The aircraft vibrations and characteristic nose drop were similar. "I had taken extreme caution to do everything perfectly." (9:--) Then he heard, "Get out, get out, get out!" over the radio. (6:3) One pilot quickly reflected over the previous two aircraft losses the unit had suffered as his airplane shook violently and pitched down--"I can't believe this is happening to me! . . . It's time to get out.' The other two guys were hit by or went through the canopy. I'm bigger and taller; what will happen to me? 'It's hot; it's fear.' Pull the ring. Then it's over; 'I'm safe.'" (9:--) Yet, we all were soon to learn, there were other aspects besides merely surviving an aircraft mishap.

Notoriety

The notoriety stemming from these incidents did have an impact on how peers and superiors viewed the pilots. The impact from the cases is dramatically split between those who were able to recover the aircraft and those who ejected.

In general, the pilots who had been able to bring the aircraft safely home were well and justifiably recognized by their peers and superiors. "It was good for my career." (9:--) ". . . There seems to be a feeling among the 'higher-ups' that I will perform well in any emergency." (9:--) "It was nice to be recognized for doing my job well, especially for my airmanship skills." (9:--) A couple of the pilots did attest to not liking the publicity and preferred to keep things "low key." (9:--) All of these pilots did receive well-deserved recognition ranging from "Well Done" accolades in Combat Crew Magazine to the Air

Force's highest awards for airmanship. But there are no awards when you cannot bring the "Lady" home.

Ejecting from an aircraft carries with it a peculiar stigma in its notoriety. Although peers and superiors praised the timely decisions to leave disintegrating airplanes, an ever-present cloud of "having one more takeoff than landings" still followed. They all knew and acknowledged the difficult choice we had to make, but we *could not* bring our aircraft home. (9:--) Even as time passed, "it was like bad luck to ask about this tragedy in case it might rub off on you. Guys are also reluctant to talk about something which might be personal to you." (9:--) Those who did talk seemed curious to "touch the fear." (9:--) Most crewmembers are supportive, but some individuals have expressed negative feelings. (9:--) The aura from an ejection is very distinct from the "positive strokes" associated with recovering a malfunctioning aircraft. The distinction also carries over into the incident's influence on the family.

Family Impact

Most of the potential ejectors received praise and acceptance for their flying feats from the members of their immediate families. When asked how their family responded to the incidents the answers were "proudly" (9:--) and this "validated their [the family's] opinion of me, my job, and the Air Force." (9:--) Other families acknowledged the accomplishments, but also felt these events are to be expected as part of a flying career. (9:--) The impact on family members was different among those who had ejected.

Three of the four ejectors were married and had children at the time of the ejections, and saw what impact the incident had on the family. Years later, "my family is still not comfortable with my choice to continue flying," one pilot affirmed. (9:--) The children and spouses hold their fear as "Daddy" goes off to fly, but can't help occasionally wondering if he'll be coming home tonight. (9:--) The families also must cope with how this trauma has affected "Daddy." Those who ejected acknowledged "mood swings," "personality shifts," "flirtation with alcoholism," or "early 'mid-life crisis.'" (9:--) These factors caused a strain on marriages and stress for our children.

Future Ejection Decisions

Any serious emergency would cause most pilots to step back and re-evaluate *when will I eject?* Will the experience of a critical emergency or having already ejected have an influence on

a possible future decision to eject?

In this area, the pilots studied had a consensus of opinion. In their experiences, each pilot weighed the possibilities of recovering the aircraft or having to leave it. Today the approach remains the same. "I don't have the feeling that 'I did it once [recovered the aircraft], I could do it again.' If faced with a serious emergency again, I wouldn't hesitate to eject if I had to." (9:--) "I still have the same plan I've had for years. Always have a way out!" (9:--) "Each situation varies, yet the final question is--can I fly or must I leave?" (9:--) Even after having experienced an ejection, the pilot's individual ejection parameters cannot change. When that fine decision line is crossed, the pilot must react and accept what follows. (9:--) One event that will follow an ejection is the accident investigation.

The Investigation

An Air Force safety "mishap investigation" has the purpose of determining what went wrong so that an effort can be made to prevent a similar occurrence in the future. This investigation may find fault with the pilot's decisions or actions; however, by regulation the findings cannot be used to assess criminal guilt for negligence or willful act, or be used as evidence in Flight Evaluation Board (FEB) proceedings. (7:1,2) A separate investigation held under AFR 110-14 determines guilt but cannot use information uncovered in the safety investigation. (7:1,2) All crewmembers involved in an investigation are briefed on this distinction. (9:--) None-the-less, the nature and conduct of these investigation boards were strikingly similar toward the pilots.

By definition, the purpose of an investigation is to "dig" for facts and make findings/recommendations. But in the case of these aircraft mishap investigations, the pilots felt more under a personal assault than participating in fact finding. One pilot stated, "The investigators should have been aircraft-centered, not pilot-centered. . . . No one ever said I did the right thing." (9:--) "I faced death, did my best during those few seconds in which I balanced the aircraft and my life, and survived for the opportunity to be belittled, blamed, and badgered. . ." (9:--) In another case, a board member actually told the pilot that he felt the ejector should never fly the U-2 again "because you lost one and we can't afford the chance of it happening a second time." He made this comment near the close of the investigation and in spite of clear evidence the failure had been with the airplane and not with the pilot. (9:--) Another pilot, when asked what he would have liked to have seen handled differently through his investigations, simply asked, "How about

a little protection for the accused?" (9:--) Having survived an ejection and eventual vindication by "the system", each pilot then faced the challenge of "getting back on the horse."

Return to Flying

The primary cause of the accidents, in this limited study of four ejections, seems to play a major role in the pilots' feelings in returning to flying. All the pilots questioned wanted, and even needed, to get back flying again. (9:--) Yet, an ejection experience is what can be described as a *very significant emotional event*. In a case where pilot error was the primary cause of the crash, the pilot "felt elated to be airborne again" just in his airlift to a military hospital. Later when he returned to flight status, "it was like I never left." (9:--) When mechanical failure had been the cause of the accident, the reaction was quite different.

Following an experience where a sudden aircraft failure leads to an out-of-control situation and subsequent ejection, the pilot has serious misgivings about trusting that air machine again. All three pilots who experienced mechanical failures resulting in the aircraft self-destruction readily admitted to many months of "white-knuckled" flights before getting comfortable in the cockpit again. (9:--) One pilot related, "I initially made movements to get out of the Air Force, or flying, or both. If I were to stay, I knew it would mean overcoming an incredible fear." (9:--) For another, "every turn, every buffet, every warning horn" had his heart in his throat on his first flight. (9:--) "On my first few sorties, I'd periodically look at the ejection ring between my knees scared to death that I might have to pull it again but knowing I must if the situation required it." (9:--) All the ejection pilots also experienced occasional mental flashbacks as well. (9:--) "Months after the crash, I had a flashback experience on an operational mission far from friendly shores and spent the next eight and a half hours of the flight so frightened I was rigid, just waiting for the airplane to fall apart around me." (9:--) But the key for all of the ejectors was, "I controlled my fear!" (9:--) "I still haven't forgotten any part of the ordeal. I live with the reality but it doesn't cause the fear that blinds." (9:--)

Chapter 3

LESSONS

The experience of these incidents and mishaps can provide several relevant insights to those who could be involved in future emergencies. This chapter will briefly explore what a crewmember could learn (and possibly anticipate during future events) from these mishap investigations, the medical treatment received, the family reactions, the re-initiation to flying, and training for an emergency. Even more importantly, this chapter will further discuss the ejection decision and several of its significant determinators--command influence, temporal distortion, and the "common thread." However, let us first examine the mishap investigation.

Being Investigated

The mind set of the investigation board members should be impartial in their analysis, but they must also have an appreciation for what the pilot has been through. However, examples of inadequate impartiality and sensitivity are very evident from Chapter 2. As noted before, a board member expressed his opinion that a pilot should not return to flying U-2's "because you already lost one. . ." (9:--). The techniques used in the questioning of the crewmembers were often callous as well. "The team came to my hospital bed three days after the accident. [Still under the influence of pain reducing drugs,] they asked questions pointed at me. There were six of them and one of me. Questions came from all directions. A tape recorder was used. I felt naked, exposed, and vulnerable to making mistakes. I didn't want them to bring me more emotional pain." (9:--). Another pilot stated, "As people [members of the board] asked more questions, I got more and more defensive. The questions focused on the pilot. 'You're new to the program; did you overspeed the aircraft?' Their focus was on me, yet the failure lay in the aircraft structure." (9:--). From this perspective, the pilots appear to view the investigation more as an assault than as an attempt to find solutions. Yes, answers must be found so that safe flying can continue, but crewmembers cannot automatically assume the board members' open-mindedness or empathy for the trauma associated with an ejection experience. In the same light, the crewmember cannot expect a large degree of

empathy from the medical team.

Medical Inspection

To the medical team, a crewmember who has ejected becomes somewhat of a study specimen. As described in Chapter 1, I was shuttled from stop to stop almost as a "side-of-beef." The medical team professed their caring attitude, but in most treatments the care seemed to be lacking, while the study was intense. The hospital staff forced another crash victim to undergo numerous and repeated examinations and work on his jaw and back without substantial explanations or delicate handling. (9:--) Even if the medical efforts did seem callous and were not always well received, one must generally assume they were well intentioned. (9:--) After experiencing an aircraft mishap, the pilot should anticipate an intensive if, "cool," medical effort to speed his physical recovery. However, the physical wounds that the medical team mends often heal faster than the emotional trauma suffered by the family and the pilot.

Family Reaction

An ejection, as opposed to a serious but recoverable emergency, has a significant impact on the pilot's family. One of the non-ejection pilots said his wife didn't know of his incident until she saw a published account of it. As that pilot stated, "I try not to take work home with me. It's easier not having to worry about your family worrying." (9:--) In contrast, the families of those who ejected have a *de facto* anxiety. "One year after the accident, my youngest son, then 5 years old, finally talked about how he felt." (9:--) "Before I go TDY, I first have to convince my family that *I will be coming home*, and then I must feel in my heart that I can keep that promise," remains a vivid memory for one who *pulled the ring*. (9:--) Luckily, anxiety generally subsides with the passage of time. Yet, most of the ejectors did not have the advantage of time before having to confront their fear and climb back in the cockpit.

Flying Again

In ejection situations, where a mechanical failure led to the ejection, the pilots had an inherent fear that the aircraft will fail them again. "The mishap board cleared me to fly 10 days after I had ejected. I wanted to do it to prove I wasn't afraid--that I knew the accident wasn't my fault. But I was afraid; who wouldn't be?" (9:--) Another pilot offered, "I *didn't* want to get on the next horse and ride into battle."

(9:--) The squadron staff recommended another crash victim first fly in the two-seat TR-1B (as opposed to the single-seat U-2/TR-1), but he declined. He later regretted not having been ordered to have his first flight after the ejection with another pilot in the TR-1B. Instead he felt he had to be *macho* and fly solo while being terrified every minute of the flight that the "Dragon Lady" may again push him near to death. (9:--) An ejection experience is a *significant emotional event*. Commanders and peers must attempt to understand part of the ejection trauma and realize "getting back in the saddle" is not as easy as the pilot may outwardly profess. If facilities and aircraft permit, a pilot who has ejected should be required to fly in the two-seat model before returning to solo flight.

Training for an Emergency

Every emergency situation has its perils. In some cases, recovery from that situation can be somewhat harrowing, but it can usually be dealt with through textbook procedure and common sense. (9:--) "[Due to proper training and practice], I never got into a position from which I could not successfully recover the aircraft, and was not faced with that [the ejection] decision." (9:--) The focus of training is to recover the aircraft--"it should still be flyable." (9:--) However, this is not always the case. "When I found myself with an uncontrollable aircraft, my primary thought was, 'What am I doing wrong?'" (9:--) In fact, of the nine cases involved in this study, four pilots acknowledged initially (if just momentarily) thinking that they had somehow induced the situation because *this isn't supposed to happen*. (9:--) Three others agreed the rapid onset of events led to simple survival responses while they harbored questions as to what was really going on. (9:--) "Every pilot has a vision of a stereotype aircraft [emergency or] crash. . . [Yet] studies have shown that an aircraft crash is not an instantaneous smoking hole but instead is the result of a sequence of events that lead to that hole." (5:8) Each pilot must expect the unexpected and respond to each situation as necessary. The experience of just the incidents studied here has shown that different, and therefore, unexpected events will occur. Knowing you're sitting in a capable ejection system must also have an important part in the thought-decision-react process.

The Decision Line

The ejection decision is always a difficult one. As explained above, pilot training and procedures are designed around the recovery of the aircraft if at all possible. (8:--) A crewmember must have confidence in himself and his aircraft to

complete his daily mission. (9:--) Yet, situations occur where the decision must be made, and each individual must then live (or die) with that decision. As discussed in Chapter 2, most fatalities are the result of delayed ejection attempts. Many factors have been studied which can influence and thus delay a decision to eject. (8:--) Of these factors, I will briefly explore command influence, temporal distortion, and the "common thread" of the four ejections studied here. First, what is the impact of command pressure?

Command Influence

A pilot's perception of what "the boss" thinks of losing one of his aircraft does play a role in the decision. An A-6 taking-off from Beale AFB, CA, found itself in trouble shortly after liftoff because of a wrong flap setting. As the aircraft stalled at low altitude, the navigator ejected. The pilot did not "get out" until the airplane mushed onto the ground and exploded. Luckily, he survived and later admitted he had delayed because of the fear of command reprisal for his error. (9:--) An article from TIG Brief asserts, ". . .The ejection decision is not perceived to be unanimously supported, formally or informally, by all levels within the Air Force, even when it is successful and timely, and regardless of the reason for ejection." (4:17) When this perception is sustained, a degree of the decision-making process is taken out of the cockpit and confuses the aircrew. (4:17) Fortunately, command influence is not always negative. Specifically, supervisors on the ground radioed instructions to eject if the pilot deemed it necessary in three of the five non-ejection cases studied here. (9:--) The pilots who did eject expressed a general belief that their commanders felt they had responded properly to their individual situations and did show genuine concern for their well-being. (9:--) Although a case can be made for the role of command influence in the decision to eject, a lack of situational awareness can also be a factor.

Temporal Distortion

"A temporary false perception which slows the apparent passage of time," can have a fatal influence on a delayed ejection. (1:9,10) This phenomenon is called temporal distortion. (1:10) Under conditions of high stress "the brain instantly becomes intensely alert, increases its efficiency, and begins to process information at an accelerated rate. . . Time appears to slow down." (1:10) As I described pulling the ejection ring in Chapter 1, "The very rapid sequence of events now became slow motion." What makes this phenomenon so dangerous is that the onset of the distortion varies with each incident and

the people involved. (1:26) A temporal distortion prior to an ejection decision can give a false impression to the crewmember that he has far more time to make that decision when in fact there are only seconds. (1:26) "There are nebulous times when ejection is not attempted because the crew just doesn't recognize the need to eject." (3:12) That realization is also where the common thread lies for those who have made and survived the decision.

Common Thread

The common thread that unites the pilots who ejected was the very stark recognition that ejecting was the only alternative to dying. One pilot remembered, "I was going down fast. I could barely see as my head/helmet smacked against the canopy sending shockwaves through my brain. . . Pull up. . . The nose wouldn't come up." (9:--) Another described the onset of his ejection, "In attempting to roll wings level. . . I felt the tail separate. I was pinned against the canopy by the negative G's." (9:--) Yet, they maintained their situational awareness and knew when they had to leave a "no-win" environment. The ejection pilots studied here and others agreed on one primary point--when the analysis is *I can do nothing else*--"the decision to pull the handle is quite obvious." (9:--) (3:13) What follows from this realization is the most important lesson to be gained from this study.

Any crewmember of an ejection seat equipped aircraft must be aware of the factors that influence a decision to eject, and each individual must determine where his "decision line" is *before* that fateful mission. "The time to think about ejection is before the fact. The cockpit gets awfully busy when something goes wrong, and that isn't the time to analyze your personal ejection parameters." (3:13) Command influence and temporal distortion as discussed above can slow our decisions. "As pilots, we are trained to fly, not flee; however, there is a time when fleeing becomes the only real decision." (6:4) Know when the situation has exceeded your or the aircraft's limits. Even though no one gives awards for ejecting, there is always one reward. It's called living.

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APPENDIX

APPENDIX A

QUESTIONS ASKED OF EMERGENCY PILOTS

1. Please give a brief description of your incident.
2. During this incident, did you seriously contemplate ejecting? Why or why not?
3. What factors did you consider in deciding to stay with the aircraft versus "getting out"?
4. We have all gotten some "notoriety" from our incidents. How do you feel about the publicity that surrounded your event?
5. Would your experience in this incident encourage or discourage you to eject if faced with another serious aircraft malfunction? Why?
6. If your family is aware of the incident, how did they respond?
7. May I attribute your responses to all questions directly to you? If no, please specify.

APPENDIX

APPENDIX B

QUESTIONS ASKED OF EJECTION PILOTS

1. Please give a brief description of your bailout incident.
2. What was your thought process leading up to your ejection? What things did you consider?
3. What were your feelings throughout the accident investigation?
4. Did you have any difficulty getting "comfortable" flying again? If so, please describe.
5. Did other pilots treat you differently after the accident? If so, how was it different and how did you feel about it?
6. Describe the things you liked and didn't like on how the Air Force handled the reporting and investigating of your accident, and your return to flying status.
7. In reference to the question above, what would you have liked to see done differently?
8. How did your ejection affect your family?
9. Would the experience of your ejection influence your handling of another serious emergency or possible "decision to eject"? Why?
10. May I attribute your responses to all questions directly to you? If no, please specify.